

CLAIMS

1. A high frequency module comprising:

a diplexer for separating signals of a plurality of communication systems transmitted and received via an antenna, the communication systems having transmission and reception bands of different frequency bands, the signals of a plurality of communication systems being separated into a signal of a first communication system having a transmission and reception band in an area higher than a predetermined frequency and a signal of a second communication system having a transmission and reception band in an area lower than a predetermined frequency;

a first switch circuit for switching transmission and reception of the signal of the second communication system having a transmission and reception band in a lower area; and

a second switch circuit for switching transmission and reception of the signal of the first communication system having a transmission and reception band in a higher area, wherein,

the diplexer, the first switch circuit, and the second switch circuit are constituted of electrodes provided on a laminated body constructed by stacking a plurality of dielectric layers and components mounted on the laminated body,

the diplexer includes a low pass filter allowing the signal of the second communication system having a transmission and reception band in a area lower than a predetermined frequency to pass through and a high pass filter for allowing the signal of

the first communication system having a transmission and reception band in an area higher than a predetermined frequency to pass through,

the first switch circuit includes a first transmission and reception signal input and output unit connected to the low pass filter of the diplexer and configured to output a predetermined transmission signal of the second communication system having a transmission and reception band in a lower area and to input a predetermined reception signal, a first transmission signal input unit for inputting the transmission signal, a first reception signal output unit for outputting the reception signal, and a diode for switching the connection between the first transmission and reception signal input and output unit and one of the first transmission signal input unit and the first reception signal output unit in accordance with a control signal,

the second switch circuit includes a second transmission and reception signal input and output unit connected to the high pass filter of the diplexer and configured to output a predetermined transmission signal of the first communication system having a transmission and reception band in a higher area and to input a predetermined reception signal, a second transmission signal input unit for inputting the transmission signal, a second reception signal output unit for outputting the reception signal, and a FET switch element for switching the connection between the second transmission and reception signal input and output unit and one of the second transmission signal input unit and the

second reception signal output unit in accordance with a control signal,

the high pass filter includes a first capacitive element connected between the antenna and the second switch circuit and a series circuit having a dielectric element and a second capacitive element, the series circuit being connected between the second switch side of the first capacitive element and the ground, and

the second capacitive element includes a ground electrode provided on a dielectric layer close to the bottom surface of the laminated body and an electrode opposing the ground electrode.

2. The high frequency module according to Claim 1, wherein the diplexer separates signals of at least four communication systems into a signal of a first communication system having a transmission and reception band in an area higher than a predetermined frequency and a signal of a second communication system having a transmission and reception band in an area lower than a predetermined frequency.

3. The high frequency module according to Claim 1 or 2, wherein the FET switch element is a GaAs switch.

4. The high frequency module according to one of Claims 1 to 3, wherein a low pass filter includes a third capacitive element and a second dielectric element, the low pass filter being provided

between the diplexer and the second switch circuit.

5. The high frequency module according to one of Claims 1 to 4, wherein a low pass filter includes a fourth capacitive element and a third dielectric element, the low pass filter being provided on the transmission signal input unit side of the second switch circuit.

6. The high frequency module according to Claim 5, wherein the second dielectric element and the third dielectric element are provided in different areas when viewed from the top.